

Appl. No. 10,628,181  
Amdt. Dated 24 August 2005  
Reply to Office action of 10 June 2005

### REMARKS/ARGUMENTS

Applicant appreciates the consideration shown by the Office, as evidenced by the Office Action, mailed on 10 June 2005. In that Office Action, the Examiner rejected claims 1-4 and 6 under 35 USC 102(b) on Chandross et al. US3809732 or Suzuki et al. US4877717, rejected claims 1-40 under either Chandross or Suzuki in view of White US6624077; provisionally rejected claims 1-40 under the judicially created doctrine of obviousness-type double patenting on Gorczyca US20040101782, Application 10/306,439. After consideration of the Office Action, claims 1 and 11 have been amended, and claims 9, 12, and 41-63 have been canceled. Claims 1-8, 10-11, and 13-40 are under consideration in the present application. Applicant respectfully requests reconsideration of the application by the Examiner in light of the above amendments and the following remarks offered in response to the Office Action.

#### Procedural Matter – Claim Amendments

Applicant respectfully submits that claim 1 has merely been amended to include the already claimed subject matter of canceled claim 9 such that no new search should be required as a result of this amendment.

Applicant respectfully submits that claim 11 has been amended to correct a typing error. It is consistent with claim 16 and therefore also does not require a new search.

#### 35 USC 102 - Chandross

With respect to the rejection of claims 1-4 and 6 under 35 USC 102(b) over Chandross, Applicant respectfully submits that Chandross does not teach or disclose the amended independent claim 1 recitations of:

1. (currently amended) A method of forming a waveguide comprising a core region, a cladding region, and an index contrast region situated therebetween, the method comprising:  
depositing a polymerizable composite on a substrate to form a layer,  
patterning the layer to define an exposed area and an unexposed area of the layer in a manner such that the unexposed area includes the core region,  
irradiating the exposed area of the layer, and  
volatilizing the uncured monomer to form the waveguide, wherein the polymerizable composite comprises a polymer binder and sufficient quantities of an uncured monomer to diffuse into the exposed area of the layer and form the index contrast region.

More specifically, Chandross clearly exposes the area to form the core as can be seen from FIG. 2D and from column 2 lines 48-56 which discuss using the exposure to lock in the dopant and column 2, lines 56-60 which reference then removing the dopant from the unexposed areas. Chandross also does not disclose an index contrast region or a composition with "sufficient quantities of an uncured monomer to diffuse into the exposed area of the layer and form the index contrast region." The structure is heated to evaporate unexposed dopant, and neither diffusion nor an index contrast region appear to be addressed (column 5, lines 42-52).

Accordingly, Applicant respectfully submits that claim 1 and claims 2-4 and 6 which depend therefrom define allowable subject matter over Chandross.

Appl. No. 10,628,181  
Amdt. Dated 24 August 2005  
Reply to Office action of 10 June 2005

### 35 USC 102 - Suzuki

With respect to the rejection of claims 1-4 and 6 under 35 USC 102(b) over Suzuki, Applicant respectfully submits that Suzuki does not teach or disclose the amended independent claim 1 recitations which are bolded above in the Chandross discussion.

Like Chandross, Suzuki exposes the area to form the core. This is most easily seen in Suzuki FIG. 24 and column 18, lines 33 through 49, as well as column 7, line 58. Suzuki also does not appear to describe a composition with sufficient quantities of an uncured monomer to diffuse into the exposed area of the layer and form an index contrast region.

Accordingly, Applicant respectfully submits that claim 1 and claims 2-4 and 6 which depend therefrom define allowable subject matter over Suzuki.

### 35 USC 103

Claims 1-40 were rejected under 35 USC 103(a) over either Chandross or Suzuki in view of White. Applicant has canceled claims 9 and 12 and moved the subject matter of claim 9 to claim 1. The independent claims are claims 1, 16, and 33.

With respect to claim 1, Applicant respectfully submits that the applied references do not teach, suggest, or disclose (either individually or in combination) the independent claim 1 recitations of:

1. A method of forming a waveguide comprising a core region, a cladding region, and an index contrast region situated therebetween, the method comprising:  
depositing a polymerizable composite on a substrate to form a layer,  
patterning the layer to define an exposed area and an unexposed area of the layer in a manner such that the unexposed area includes the core region,  
irradiating the exposed area of the layer, and  
volatilizing the uncured monomer to form the waveguide, wherein the polymerizable composite comprises a polymer binder and sufficient quantities of an uncured monomer to diffuse into the exposed area of the layer and form the index contrast region.

The Office Action states:

Chandross et al and Suzuki et al are applied generally for reasons of record as set forth in paragraph 1, supra, the primary references essentially lacking a clear showing of forming a waveguide with a cladding ... [I]f the substrate is not inherently – ie, does not inherently function as – the cladding, then White is applied to teach that waveguides are made either by application of a separate cladding layer or with the substrate functioning as such. Based on White, it certainly would have been obvious to have formed a separate cladding layer on the substrate in addition to the layer functioning as a core.

Applicant submits however that, regardless of the potential general cladding discussion of White, for reasons discussed above with respect to the 35 USC 102 rejections, a prima facie case for a 35 USC 103 rejection does not exist with respect to claim 1. For example, as stated above, neither Chandross nor Suzuki teach, suggest, or disclose patterning the layer to define an exposed area and an unexposed area of the layer in a manner such that the unexposed area includes the core region. White does not overcome this deficiency.

Claims 2-8 and 10-15 depend from claim 1 and include further recitations. With respect to claim 11, Applicant can find no disclosure, suggestion or teaching in any of the references, and no

Appl. No. 10,628,181  
Amdt. Dated 24 August 2005  
Reply to Office action of 10 June 2005

mention in the office action, of a "diffusion source region."

With respect to independent claim 16, Applicant respectfully submits that the applied references do not teach, suggest, or disclose (either individually or in combination) the independent claim 16 recitations of:

16. A method of forming a waveguide comprising a core region, a cladding region, and an index contrast region situated therebetween, the method comprising:  
providing a polymerizable composite comprising a polymer binder and an uncured monomer,  
depositing the polymerizable composite on a substrate to form a layer,  
patterning the layer to define an exposed area and an unexposed area of the layer, **one portion of the unexposed area comprising the core region and another portion of the unexposed area comprising a diffusion source region,**  
irradiating the exposed area of the layer, and  
volatilizing the uncured monomer to form the waveguide and index contrast region.

Applicant illustrates diffusion source regions in FIGs. 14-19 and describes them in paragraphs 59-65. No specific reference to such diffusion source regions appears to be present in the references or in the Office Action. The Office Action Statements (other than those above on the cladding) are inserted below for ease of reference:

Chandross et al and Suzuki et al are applied generally for reasons of record as set forth in paragraph 1, supra, the primary references essentially lacking a clear showing of ... the particular patterning steps as set forth in instant claims 16 and 33. ... Concerning the exact patterning used, it is submitted that such would have been an obvious feature in the process of either primary reference dependent on the exact waveguide desired. Both primary references disclose polymers and monomers very similar to those set forth in the instant claims and it is submitted that the exact materials used would have been within the skill level of the art. The primary references disclose patterning with a mask having windows and a grey scale mask would have been an obvious modification thereto dependent on the exact waveguide structure desired. The same is true of patterning to define at least one curve.

None of the references or these comments appear to address the concept of providing a diffusion source region in addition to the core region. This is not "an obvious feature dependent on the exact waveguide desired" but a feature that is advantageous – for example, in providing enhanced diffusion (paragraph 59) for reducing bend losses. Applicant respectfully submits that a prima facie case has not been made with respect to claim 16.

Claims 17-32 depend from claim 16 and include further recitations – some of which are clearly not disclosed, taught, or suggested by any applied reference or combination of applied references. For example, claims 23-32 are each directed to even more specific aspects of the diffusion regions regarding positioning, number, and type of regions.

With respect to independent claim 33, Applicant respectfully submits that the applied references do not teach, suggest, or disclose (either individually or in combination) the independent claim 33 recitations of:

33. A method of forming a waveguide comprising a cladding region, a core region, and a scattering region, the method comprising:  
providing a polymerizable composite comprising a polymer binder and an uncured monomer,  
depositing the polymerizable composite on a substrate to form a layer,  
patterning the layer to define an exposed area and an unexposed area of the layer, **one area of the exposed and the unexposed areas comprising the cladding region, and another area of the exposed and the unexposed areas comprising the core region and the scattering region,**  
irradiating the exposed area of the layer, and  
volatilizing the uncured monomer to form the waveguide.

Applicant illustrates scattering regions in FIG. 21 and describes them in paragraphs 67-70. No specific

Appl. No. 10,628,181  
Amdt. Dated 24 August 2005  
Reply to Office action of 10 June 2005

reference to such scattering regions appears to be present in the references or in the Office Action. Applicant respectfully submits that a prima facie case has not been made with respect to claim 33.

Claims 34-40 depend from claim 33 and include further recitations – some of which are clearly not disclosed, taught, or suggested by any applied reference or combination of applied references. For example, claims 38-40 are each directed to even more specific aspects of the scattering regions.

Accordingly, Applicant respectfully submits that the claimed invention defines allowable subject matter over the applied art. Withdrawal of the 35 USC 103 rejection is respectfully requested.

Judicially created doctrine of obviousness-type double patenting

Applicant traverses the statement that the claims are not patentably distinct. Features discussed in the remarks relating to the 35 USC 103 rejection do not appear to be present in the claims of Application No. 10/306,439. Several examples include the composition aspects of claim 1, the diffusion source regions of claim 16, and the scattering regions of claim 33.

Summary

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact Applicant's undersigned representative at the telephone number below.

Respectfully submitted,

By Ann M. Agosti  
Ann M. Agosti  
Reg. No. 37,372  
General Electric Company  
Building K1, Room 3A66  
One Research Circle  
Niskayuna, New York 12309  
Telephone: (518) 387-7713